CLAIMS

What is claimed is:

1. A method of coding video, comprising the steps of:

coding an uncoded video with a non-scalable codec to generate base layer frames;

computing differential frame residuals from the uncoded video and the base layer frames, at least portions of certain ones of the differential frame residuals being operative as references;

applying motion-compensation to the at least portions of the differential frame residuals that are operative as references to generate reference motion-compensated differential frame residuals; and

subtracting the reference motion-compensated differential frame residuals from respective ones of the differential frame residuals to generate motion-predicted enhancement layer frames.

2. A method of coding video according to claim 1, further comprising the step of coding the motion-predicted enhancement layer frames with a scalable codec.

3. A method of coding video according to claim 1, further comprising the step of coding the motion-predicted enhancement layer frames with a fine granular scalable codec.

4. A method of coding video according to claim 1, wherein the motion-predicted enhancement layer frames in the subtracting step include motion-predicted enhancement layer B-frames, the reference motion-compensated differential frame residuals in the subtracting step

include reference motion-compensated differential I- and P-frame residuals or reference motion-compensated differential P- and P-frame residuals, and the respective ones of the differential frame residuals in the subtracting step include differential B-frames.

5. A method of coding video according to claim 4, wherein the motion-predicted enhancement layer frames in the subtracting step further include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals in the subtracting step further include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals in the subtracting step further include differential P-frames.

6. A method of coding video according to claim 1, wherein the motion-predicted enhancement layer frames in the subtracting step include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals in the subtracting step include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals in the subtracting step include differential P-frames.

7. A method of decoding a compressed video having a base layer stream and an enhancement layer stream, the method comprising the steps of:

decoding the base layer stream to generate base layer video frames;

decoding the enhancement layer stream to generate differential frame residuals, at least portions of certain ones of the differential frame residuals being operative as references;

applying motion-compensation to the at least portions of the differential frame residuals operative as references to generate reference motion-compensated differential frame residuals;

adding the reference motion-compensated differential frame residuals with respective ones of the differential frame residuals to generate motion-predicted enhancement layer frames; and

combining the motion-predicted enhancement layer frames with respective ones of the base layer frames to generate an enhanced video.

8. A method of decoding video according to claim 7, wherein the motion-predicted enhancement layer frames in the adding step consist of motion-predicted enhancement layer B-frames, the reference motion-compensated differential frame residuals in the adding step consist of reference motion-compensated differential I- and P-frame residuals or reference motion-compensated differential P- and P-frame residuals, and the respective ones of the differential frame residuals in the adding step consist of differential B-frames.

9. A method of decoding video according to claim 7, wherein the motion-predicted enhancement layer frames in the adding step include motion-predicted enhancement layer B-frames, the reference motion-compensated differential frame residuals in the adding step include reference motion-compensated differential I- and P-frame residuals or reference motion-compensated differential P- and P-frame residuals, and the respective ones of the differential frame residuals in the adding step include differential B-frames.

10. A method of decoding video according to claim 9, wherein the motion-predicted enhancement layer frames in the adding step further include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals in the adding step further include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals in the adding step further include differential P-frames.

11. A method of decoding video according to claim 7, wherein the motion-predicted enhancement layer frames in the adding step include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals in the adding step include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals in the adding step include differential P-frames.

12. A memory medium for encoding video, the memory medium comprising:

code for non-scalable encoding an uncoded video into base layer frames;

code for computing differential frame residuals from the uncoded video and the base layer frames, at least portions of certain ones of the differential frame residuals being operative as references;

code for applying motion-compensation to the at least portions of the differential frame residuals that are operative as references to generate reference motion-compensated differential frame residuals; and

code for subtracting the reference motion-compensated differential frame residuals from respective ones of the differential frame residuals to generate motion-predicted enhancement layer frames.

13. A memory medium for encoding video according to claim 12, further comprising code for scalable encoding the motion-predicted enhancement layer frames.

14. A memory medium for encoding video according to claim 12, further comprising code for fine granular scalable encoding the motion-predicted enhancement layer frames.

15. A memory medium for encoding video according to claim 12, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer B-frames, the reference motion-compensated differential frame residuals include reference motion-compensated differential I- and P-frame residuals or reference motion-compensated differential P- and P-frame residuals, and the respective ones of the differential frame residuals include differential B-frames.

16. A memory medium for encoding video according to claim 15, wherein the motion-predicted enhancement layer frames further include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals further include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals further include differential P-frames.

17. A memory medium for encoding video according to claim 12, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals include differential P-frames.

18. A memory medium for decoding a compressed video having a base layer stream and an enhancement layer stream, the memory medium comprising:

code for decoding the base layer stream to generate base layer video frames;

code for decoding the enhancement layer stream to generate differential frame residuals, at least portions of certain ones of the differential frame residuals being operative as references;

code for applying motion-compensation to the at least portions of the differential frame residuals operative as references to generate reference motion-compensated differential frame residuals;

code for adding the reference motion-compensated differential frame residuals with respective ones of the differential frame residuals to generate motion-predicted enhancement layer frames; and

code for combining the motion-predicted enhancement layer frames with respective ones of the base layer frames to generate an enhanced video.

19. A memory medium for decoding a compressed video according to claim 18, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer B-frames, the reference motion-compensated differential frame residuals include reference motion-

compensated differential I- and P-frame residuals or reference motion-compensated differential P- and P-frame residuals, and the respective ones of the differential frame residuals include differential B-frames.

20. A memory medium for decoding a compressed video according to claim 19, wherein the motion-predicted enhancement layer frames further include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals further include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals further include differential P-frames.

21. A memory medium for decoding a compressed video according to claim 18, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals include differential P-frames.

22. An apparatus for coding video, the apparatus comprising:

means for non-scalable coding an uncoded video to generate base layer frames;

means for computing differential frame residuals from the uncoded video and the base layer frames, at least portions of certain ones of the differential frame residuals being operative as references;

means for applying motion-compensation to the at least portions of the differential frame residuals that are operative as references to generate reference motion-compensated differential frame residuals; and

means for subtracting the reference motion-compensated differential frame residuals from respective ones of the differential frame residuals to generate motion-predicted enhancement layer frames.

23. An apparatus for coding video according to claim 22, further comprising means for scalable coding the motion-predicted enhancement layer frames.

24. An apparatus for coding video according to claim 22, further comprising means for fine granular scalable coding the motion-predicted enhancement layer frames.

25. An apparatus for coding video according to claim 22, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer B-frames, the reference motion-compensated differential frame residuals include reference motion-compensated differential I- and P-frame residuals or reference motion-compensated differential P- and P-frame residuals, and the respective ones of the differential frame residuals include differential B-frames.

26. An apparatus for coding video according to claim 25, wherein the motion-predicted enhancement layer frames further include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals further include reference motion-

compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals further include differential P-frames.

27. An apparatus for coding video according to claim 22, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals include differential P-frames.

28. An apparatus for decoding a compressed video having a base layer stream and an enhancement layer stream, the apparatus comprising:

means for decoding the base layer stream to generate base layer video frames;

means for decoding the enhancement layer stream to generate differential frame residuals, at least portions of certain ones of the differential frame residuals being operative as references;

means for applying motion-compensation to the at least portions of the differential frame residuals operative as references to generate reference motion-compensated differential frame residuals;

means for adding the reference motion-compensated differential frame residuals with respective ones of the differential frame residuals to generate motion-predicted enhancement layer frames; and

means for combining the motion-predicted enhancement layer frames with respective ones of the base layer frames to generate an enhanced video.

29. An apparatus for decoding a compressed video according to claim 28, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer B-frames, the reference motion-compensated differential frame residuals include reference motion-compensated differential I- and P-frame residuals or reference motion-compensated differential P- and P-frame residuals, and the respective ones of the differential frame residuals include differential B-frames.

30. An apparatus for decoding a compressed video according to claim 29, wherein the motion-predicted enhancement layer frames further include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals further include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals further include differential P-frames.

31. An apparatus for decoding a compressed video according to claim 28, wherein the motion-predicted enhancement layer frames include motion-predicted enhancement layer P-frames, the reference motion-compensated differential frame residuals include reference motion-compensated differential I-frame residuals or reference motion-compensated P-frame residuals, and the respective ones of the differential frame residuals include differential P-frames.